

Eastern Hemisphere, while the Phyllostomidæ are limited to America, the Vespertilionidæ and Emballonuridæ, as directly derived from the ancestral group (Palæochiroptera), being common to both hemispheres. But another distributional fact may also be observed—namely, that the most highly differentiated and most highly organized species of the Vespertilionine and Emballonurine alliances respectively belong to families of very limited distribution. Thus the closely allied Nycteridæ and Rhinolophidæ have nearly the same distribution—the former family being confined to tropical and subtropical Africa, Asia, and Australia, the latter to the same continents, a few species extending into Europe; while the Phyllostomidæ are absolutely limited to tropical America. The Pteropidæ, including the largest bats, are strictly limited to the tropical and subtropical regions of the Old World from Western Africa to the Navigators' Islands; and of these the genera containing the most highly differentiated forms have also the most strictly defined range. This is precisely what we should expect if we regard these families as later developments of the Vespertilionidæ and of the Emballonuridæ. While the older forms are found in both hemispheres, the later developments are still limited to the regions, or remains of the regions, in which they first originated, restricted by changes which had taken place in the distribution of land and water previous to their origin, but subsequent to the appearance of the forms from which they were derived.

XLVIII.—On the "*Cow-fish*" (*Tursio metis*) of the Sounds on the West Coast of Otago, New Zealand. By F. W. HUTTON, Curator of the Otago Museum, Dunedin.

Tursio metis, Gray, Zool. Erebus and Terror,
p. 38, t. xviii.

Female. Teeth $\frac{23}{22} \cdot \frac{23}{22}$, exactly three in an inch. Body elongate, thickest in front. Dorsal fin falcate, commencing before the middle of the back; its height less than the length of the pectoral fins. Pectoral fins as long as the gape, falcate, on a restricted base. Lower jaw longer; attenuated portion of the snout short.

Colour. Above and upper jaw dark slate-blue, passing gradually into white below; the white of the underparts not

It is remarkable how very closely the measurements of the body of this animal agree with those given by Dr. Hector, in the 'Trans. N.Z. Institute,' vi. p. 85, of a porpoise from Cook Straits that he refers to *Delphinus Forsteri*. The Dusky-Sound specimen, however, differs considerably both in colour and form from the figure of *D. Forsteri* in the 'Voyage of the Erebus and Terror;' while Dr. Hector says that the Cook-Straits specimen "does not differ sufficiently from that copied last year after Forster to make it worth reproduction."

The skeleton is being prepared for the Otago Museum.

XLIX.—*On the Geological Structure of the Amazons Valley.*
By Professor JAMES ORTON*.

THE valley of the Amazons is a very shallow basin of vast extent and of an oval shape, with the small end pointing eastward. Between December and June a large part of it resembles a huge undrained swamp, and people sail half the year above districts where for the other half they walk. Were the forest removed from the Lower Amazons, a great mud flat would be exposed (lower than the island of Marajó), threaded by a network of deep channels, partially covered by every tide, and deluged by the annual flood. From the marked feature (first noticed by Chandless) that the tributaries enter the main stream at a very acute angle, and have exceedingly tortuous courses, it is inferred that the rest of the valley is a nearly level plain gently inclined from west to east, and with very little slope on either side toward the centre of drainage.

Between Borja and Pará, a distance of 29°, the inclination is only 500 feet. A section from Exaltacion, on the Upper Madeira, which has the same altitude as Borja, to San Carlos, on the Upper Negro (which is elevated only 212 feet above the Atlantic), would show a depression at Fonte Boa, on the Amazons, of only 150 feet in 1000 miles. The Negro is a sluggish stream (San Carlos being on a level with Tabatinga); the Napo is more rapid; and the Pastássa is a torrent. In the last thousand miles, the Madeira descends 430 feet, the Purús 225, and the Ucayali 400; while the Huallága has probably a swifter current than any of the southern affluents.

The basin of the Great River is principally enclosed by the

* Communicated by the Author, being Chapter XLI. of the forthcoming new edition of his work on the Andes and the Amazons.